

A NEW JUMPING SPIDER.

BY JOHN L. CURTIS.

The subject of the following description is a spider which has been carefully studied by the writer for some time past. It was recently submitted to Prof. G. W. Peckham, who has pronounced it a new species of the genus *Dendryphantes*. Accordingly, I have thought it timely to publish a short description of the spider, together with such notes on habits, etc., as I have collected. The following will, I think, sufficiently identify it.

DENDRYPHANTES ÆNEOLUS.

Total length, 5.4 mm.; width of abdomen, 2.2 mm.

Cephalothorax, length, 2.4 mm.; width, 2.2; height, 1.8 mm.

Legs, 8.3 mm., 5 mm, 4.6 mm., 6.2 mm. Patella and tibia of the first, 2.7 mm.; patella and tibia of 2d, 1.6 mm.; patella and tibia of 3d, 1.6 mm.; patella and tibia of the 4th, 2 mm.; metatarsus and tarsus of the 4th, 1.6 mm.

Total length, 6.7 mm.; width of abdomen, 2.6 mm.

Cephalothorax length, 2.6 mm.; width, 2 mm.; height, 1.6 mm.

Legs, 6.2 mm., 4.9 mm., 4.4 mm., 5.9 mm. Patella and tibia of 1st, 2 mm.; patella and tibia of 2d, 1.6 mm.; patella and tibia of 3d, 1.2 mm; patella and tibia of 4th, 1.8 mm.; metatarsus and tarsus of 4th, 1.7 mm.

♂♀ Cephalothorax moderately high, convex, a very little dilated behind dorsal eyes with sides nearly vertical in front and rounded behind, Ephalic part level, thoracic part falling rather abruptly. Quadrangle of eyes occupying one-third of cephalothorax, one-half wider than long, same width before and behind. First row of eyes bent, inclined slightly downward, middle eyes sub-touching, lateral about one-third as large as middle eyes and separated from them by one-fourth of their own diameter. Eyes of second row midway between dorsal and lateral eyes ♂, a little farther from dorsal than from lateral eyes ♀. Dorsal eyes a little smaller than lateral eyes, farther from each other than from lateral borders, forming a row as wide as the cephalothorax at that place. Clypeus perhaps inclined a little backwards, one-third as high as middle eyes in ♂, four-fifths as high as middle eyes in ♀. Falces wider than the two middle eyes, reaching to inner margins of lateral eyes, once and a half as long as face ♂♀, divergent, inclined slightly forward. Fang strong ♂, vertical, paral-

lel; fang weaker ♀. Maxillæ blunt, cut on inner margin toward labium. Labium a little longer than wide, more than one-half as long as maxillæ; sternum oval, three-fourths longer than wide, projecting between anterior coxæ. Anterior coxæ separated by a little more than the width of the labium, much larger and longer than the others, smaller and shorter in ♀ than in ♂. Legs of first pair much larger and longer than the others ♂, somewhat larger and longer than the others ♀. Femoral joints compressed and enlarged. A few spines on femur, patella, tibia and tarsus and metatarsus of first leg, all but the patella of second, third and fourth legs, in terminal ring on tarsus of third and fourth. In the first and second pairs the spines are most numerous on the inner side of the leg. A few femoral spines on the palpi.

COLORATION.

FEMALE.—Upper cephalothorax grayish-brown with slight bronze cast and a space of polished black posteriorly just in front of the abdominal juncture. Under side black with long white hairs sparse.

The background color of upper abdomen is black or deep brown, with a heavy bronze cast over all. Beginning at the spinnerets and extending about four-fifths of the abdominal length, are two narrow, black or deep brown bands. Between these bands anteriorly is a light, tawny-yellowish area divided centrally by a dark streak. More of this yellowish color is seen along outside the bands and on the forepart of the abdomen. There is a border of the same around the anterior rim. Upon each of the black bands are four spots of the same. Side abdomen light gray, under side same, darker along the median line.

MALE.—The upper cephalothorax is usually black or has the gray-brown color only in patches. The chief difference is in the upper abdomen, which has the same ground-color and bronze cast but no yellow markings except the anterior and side rim. The bands are obliterated, but often the posterior yellow spots remain.*

EXPLANATION OF MARKINGS.

The gray-brown color of the cephalothorax is due to short, stout, slightly iridescent yellow scale-hairs scattered over the black integu-

*The foregoing description was made with a lens of a power of four or five diameters. The following was made with a compound microscope of about fifty diameters.

ment. The side color is due to the same scales and the black line along the rim is due to the absence of them. The yellowish clypeus is caused partly by long hairs and partly by scales. In the male the coloring of the clypeus is not so clearly yellow because the hairs and scales are sparser. In the upper cephalothorax these yellowish scales are interspersed with other scale-hairs of like shape but of a grayish color and most brilliant iridescence, which are particularly numerous on the forepart and produce the bronze luster. In some, especially in young specimens, these scale-hairs are thick all over.

The skin color of the upper abdomen is deep brown or black, usually appearing brown to the eye but under the microscope black with long black hairs. The yellow markings are formed of hairs like those on the cephalothorax, while the longitudinal dark bands are simply parts of the dark integument set in relief by the yellow scale-hairs. The yellow along outside of bands is in natural females a close collection of these scales, but in gravid females it appears as a series of oblique, backward streaks, one from each of the dots on the bands. This indicates weak portions of the integument, which stretch to make room for the eggs. Bronze hairs also, like those on the cephalothorax, are thickly set between the bands posteriorly, outside the bands anteriorly, and on the forepart of the abdomen. Others are scattered among the yellow hairs. The yellow border in both sexes is composed in part of longer hairs than those forming the other markings. The dark upper abdomen of the male is due to the absence of yellow scale-hairs, although there are enough bronze scale-hairs to give it a luster. The under abdomen has the same black skin covered with nearly white scale-hairs of a smaller size than the yellow ones. They are not so thickly set along the middle and the skin shows through, forming the darker central band. Male legs dark brown with darker brown rings, as follows: Last half of femur dark brown with tip end lighter; last end of tibia gradually darker; light scale-hairs on all except first two joints. The second pair of legs have dark rings on patella, tibia and tarsus; metatarsus with a black tip; scales as in first pair; third and fourth pair same. Palpi light brown, last joint dark, dark hairs on last joints, light hairs on others; light yellow scales on femur and two succeeding joints; mouth-parts, coxæ and sternum dark brown; anterior coxæ darker than posterior; falces nearly black; fang red-brown.

Female, first and second leg of a uniform light-brown with a black tip, light and dark hairs, sparse scale-hairs on all except first two joints. Third and fourth legs same with tarsus and metatarsus lighter. Some have a narrow dark ring on tibia of the third and fourth pairs; others have a dark ring on patella, tibia, and tarsus of the same. Palpi light-brown with light hairs.

The markings of this spider often rub off, giving rise to individual differences.

This brilliant bit of a spider is quite common about San Francisco Bay, but has not yet been reported elsewhere. It is found on many plants, but in gardens where I have observed it most, it is more frequently seen on honeysuckle, rose bushes, live-oaks, and the shrub known as laurestina. The last two seem to offer peculiar advantages, for not only do the leaves lie closely together, but the oak leaves are curled and the laurestina leaves are quite often rolled lengthwise. Between two leaves in the one case, or within the rolled leaf in the other, the spider finds a safe retreat, while the dead live-oak leaves, where they lodge together in hollows, furnish spacious cavities between them for the web domiciles.

The domicile is a simple flat tube, open at both ends, with sometimes an open branch tube from the main one. The spider enters by inserting the fore legs between the sheets of webbing and holding them apart as it forces its way in. If there is danger of intruding foes, the spider holds the sheets together with the fore legs at the end most threatened.

The flat cocoon which contains the yellowish eggs is made within the tube, and the young ones share the parent domicile until after the second moult, when they depart on aeronautic tours of exploration for themselves.

The males and females appear as adults as early as April, but the former become rare after the first of June and the latter after the first of September. The females begin laying eggs in May. The number of cocoons made by a single female is not more than two, and probably, judging from captives, the general rule is to make but one. The eggs, about fifty in number, hatch on the average in about twenty-five days, and the young are found at all times of the year.

DENDRYPHANTES ÆNEOLUS is one of our so-called flying spiders, the young being especially given to that progressive method of loco-

motion. Often, when sitting in the garden, I have had one alight on my book, crawl to the top of my uplifted finger or pencil, and fly away on its web or make it a bridge to some other and usually higher point. The way of getting upon the breeze is in principle the same as with all other flyers. Arrived at the top of an elevation, the spider raises the spinnerets and emits a thread, which the wind is allowed to carry far enough to bear. If this is successful, it flies, but if the thread catches, it simply fastens it where it stands, draws it in, as it were hand over hand, until taut, and then crawls upon it to the other attachment. In most cases the fly-line flows from the posterior spinnerets, while from the anterior pair another thread is drawn, and fastened to the point upon which the insect stands, so that it has a returning line if the flying, at first successful, should afterward end in failure. If the fly-line catches, the extra line simply strengthens the first end of it, or affords return, should it break.

It can easily be seen that this way of traveling must be exceedingly advantageous to these spiders, not only because of the ease and speed which the web bridge allows, in crossing water, desert places, patches of grass or clover and other obstructed routes, but also because of the much greater speed and safety afforded by actual flight. With spiders, as with men, however, the easiest and speediest ways are most likely to be disastrous, as is shown in the following instance, which illustrates as well the instinctive endowment enabling this spider to overcome its natural enemies.

On a bright morning several years ago a pet lizard lay sunning himself on a table in the yard, when a partly grown specimen of this spider came sailing along and dropped down directly in front of him. For a second or two the spider, unconscious of the great impending danger, looked about in the seemingly intelligent way peculiar to *Attidæ*. The lizard, as yet sluggish and unawakened, was pushed toward it. Instantly the careless attitude of the spider was changed for the strategic; facing its enemy, it slowly, almost imperceptibly, drew in its legs until it looked more like a tiny chip or the top of a polished nail-head than like a spider. The saurian was then moved around behind; *æneolus*, with fixed eyes and cautious movements, turned to face him still. I put my fingers just behind the spider, but it chose to face the greater, and, from the spider standpoint, more imminent foe, and kept its eyes on the lizard. After testing in various ways without touching it, I now slightly pushed

the spider from behind with a pencil. With a sudden side jump and a rapid dash along beside the lizard, it crawled under his outstretched tail and dropped over the edge of the table into the grass. If the lizard had been lively, the spider would not have fared so well, but as it was, it not only escaped, but had more scope for showing its instinct. In the first place, instinct seemed to tell that lizards are dangerous animals. That is curious enough in itself. In the second place, it had learned, or secured by inheritance, the exact strategem which could save it from such enemies, if anything could. A lizard never devours an insect that does not very perceptibly move. A third conclusion that I drew was that the spider knew which was the most dangerous end of the reptile. At any rate, it ran under the tail, and, though in a decided hurry, seemed to feel safer out of range of the lizard's eyes than in running straight on to the other end of the table. Making due allowance for any imagination of mine on the last point, it must be conceded that such knowledge of lizard habits in a spider shows considerable intelligence.

NOTES ON HISTERIDÆ OBSERVED IN SAN DIEGO COUNTY.

BY F. E. BLAISDELL.

HOLOLEPTA. This genus is represented by six well-defined species, two of which I shall describe as new. The individuals of each, with two exceptions, are quite numerous in their season.

HOLOLEPTA YUCATECA Mars. Found in the decaying fruit of *Cucurbita*, *Echinocactus viridescens*, leaves and stalks of *Opuntia occidentalis*. The largest species of the genus, body greatly depressed, head extended, with long, prominent mandibles. Mentum flat, impunctate; prosternum narrowed, and rounded at tip; sides of body more or less arcuate. Rather plentiful from May to November.

HOLOLEPTA PERVALIDA sp. nov. Form strongly oblong, narrower and much less depressed than *yucateca*; sides parallel. Mentum nearly flat, strongly punctate laterally, rather sparsely so at middle; prosternum intermediate between the preceding species and